

SEQUENCE LISTING

<110> Gillies, Stephen D.
Lo, Kin-Ming

<120> Immunocytokine Sequences and Uses Thereof

<130> LEX-023

<150> US 60/433,945
<151> 2002-12-17

<160> 6

<170> PatentIn version 3.1

<210> 1
<211> 113
<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized Immunoglobulin light chain variable region

<400> 1

Asp Val Val Met Thr Gln Thr Pro Leu Ser Leu Pro Val Thr Pro Gly
1 5 10 15

Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Val His Arg
20 25 30

Asn Gly Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45

Pro Lys Leu Leu Ile His Lys Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60

Asp Arg Phe Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65 70 75 80

Ser Arg Val Glu Ala Glu Asp Leu Gly Val Tyr Phe Cys Ser Gln Ser
85 90 95

Thr His Val Pro Pro Leu Thr Phe Gly Ala Gly Thr Lys Leu Glu Leu
100 105 110

Lys

<210> 2
<211> 113

<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized Immunoglobulin heavy chain variable region

<400> 2

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Glu Lys Pro Gly Ala
1 5 10 15

Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Ser Ser Phe Thr Gly Tyr
20 25 30

Asn Met Asn Trp Val Arg Gln Asn Ile Gly Lys Ser Leu Glu Trp Ile
35 40 45

Gly Ala Ile Asp Pro Tyr Tyr Gly Gly Thr Ser Tyr Asn Gln Lys Phe
50 55 60

Lys Gly Arg Ala Thr Leu Thr Val Asp Lys Ser Thr Ser Thr Ala Tyr
65 70 75 80

Met His Leu Lys Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Val Ser Gly Met Glu Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser
100 105 110

Ser

<210> 3
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> Linker sequence

<400> 3

Gly Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser
1 5 10 15

<210> 4
<211> 10531
<212> DNA
<213> Artificial Sequence

<220>

<223> Vector containing humanized Immunoglobulin light and heavy chain and IL-2

<400> 4

gtcgacattg attattgact agttattaaat agtaatcaat tacgggtca ttagttcata	60
gcccatatat ggagttccgc gttacataac ttacggtaaa tggccgcct ggctgaccgc	120
ccaacgaccc ccgcccattg acgtcaataa tgacgtatgt tcccatagta acgccaatag	180
ggactttcca ttgacgtcaa tgggtggagt atttacgta aactgcccac ttggcagttac	240
atcaagtgtatcatatgccca agtacgcccc ctattgacgt caatgacggt aaatggcccg	300
cctggcatta tgcccagttac atgaccttat gggactttcc tacttggcag tacatctacg	360
tattagtcat cgcttattacc atggtgatgc ggttttggca gtacatcaat gggcgtggat	420
agcgggttga ctcacgggaa tttccaagtc tccacccat tgacgtcaat gggagttgt	480
tttggcacca aaatcaacgg gactttccaa aatgtcgtaa caactccgccc ccattgacgc	540
aaatgggcgg taggcgtgta cggtgggagg tctatataag cagagctctc tggctaacta	600
cagaacccac tgcttaactg gcttatcgaa attaatacga ctcaactatag ggagaccctc	660
tagaatgaag ttgcctgtta ggctgttggt gctgatgttc tggattcctg gtgaggagag	720
agggaagtga gggaggagaa tggacaggga gcaggagcac tgaatcccat tgctcattcc	780
atgtatctgg catgggtgag aagatgggtc ttatcctcca gcatggggcc tctgggtga	840
atacttgtta gagggagggtt ccagatggga acatgtgcta taatgaagat tatgaaatgg	900
atgcctggaa tggcttaagt aatgccttag aagtgactag acacttgcaa ttcactttt	960
ttggtaagaa gagattttta ggctataaaaa aaatgttatg taaaaataaa cgatcacagt	1020
tgaaataaaaa aaaaaatata aggatgttca tgaattttgt gtataactat gtatttctct	1080
ctcattgttt cagttccctt aagcgacgtg gtgatgaccc agaccccccgt gtccctgccc	1140
gtgaccccccgcg gcgagccgc ctccatctcc tgcagatcta gtcagagtct tgtacaccgt	1200
aatggaaaca cctatttaca ttggcacctg cagaagccag gccagtctcc aaagctcctg	1260
attcacaaag ttccaaccg attttctggg gtcccagaca ggtagtgg cagttggatca	1320
gggacagatt tcacactcaa gatcagcaga gtggaggctg aggtctggg agtttatttc	1380
tgttctaaa gtacacatgt tcctccgctc acgttcggtg ctgggaccaa gctggagctg	1440
aaacgttta gtgtgtcagg gtttccaaag agggactaaa gacatgtcag ctatgtgtga	1500
ctaattgtta tgcactaaag ctgcggatc ccgcaattct aaactctgag ggggtcgat	1560
gacgtggcca ttcttgccct aaagcattga gtttactgca aggtcagaaa agcatgcaaa	1620
gccctcagaa tggctgcaaa gagctccaac aaaacaattt agaactttat taaggaatag	1680

gggaaagcta	ggaagaaact	caaaacatca	agatttaaa	tacgcttctt	ggtctcctt	1740
ctataattat	ctgggataag	catgctgtt	tctgtctgtc	cctaacatgc	cctgtgatta	1800
tccgcaaaca	acacacccaa	ggcagaact	ttgttactta	aacaccatcc	tgttgcttc	1860
tttcctcagg	aactgtggct	gcaccatctg	tcttcatctt	cccgcacatct	gatgagcagt	1920
tgaaatctgg	aactgcctct	gttgtgtgcc	tgctgaataa	cttctatccc	agagaggcca	1980
aagtacagt	gaaggtggat	aacgcctcc	aatcggtaa	ctcccaggag	agtgtcacag	2040
agcaggacag	caaggacagc	acctacagcc	tcagcagcac	cctgacgctg	agcaaagcag	2100
actacgagaa	acacaaagtc	tacgcctgcg	aagtcaccca	tcagggcctg	agctcgcccg	2160
tcacaaagag	cttcaacagg	ggagagtgtt	agagggagaa	gtgccccac	ctgctcctca	2220
gttccagcct	gacccctcc	catccttgg	cctctgaccc	ttttccaca	ggggacctac	2280
ccctattgcg	gtcctccagc	tcatcttca	cctcaccccc	ctccctcctcc	ttggctttaa	2340
ttatgcta	gttggaggag	aatgaataaa	taaagtgaat	cttgcaccc	gtggttctc	2400
tcttcctca	atthaataat	tattatctgt	tgtttaccaa	ctactcaatt	tctcttataa	2460
gggactaaat	atgttagtcat	cctaaggcgc	ataaccattt	ataaaaatca	tccttcattc	2520
tatttaccc	tatcatcctc	tgcaagacag	tcctccctca	aaccacaaag	ccttctgtcc	2580
tcacagtccc	ctggccatg	gtaggagaga	cttgcttct	tgtttccccc	tcctcagcaa	2640
gccctcatag	tccttttaa	gggtgacagg	tcttacggc	atatatcctt	tgattcaatt	2700
ccctggaaat	caaccaaggc	aaattttca	aaagaagaaa	cctgctataa	agagaatcat	2760
tcattgcaac	atgatataaa	ataacaacac	aataaaagca	attaaataaa	caaacaatag	2820
ggaaatgttt	aagttcatca	tggacttag	acttaatgga	atgtcatgcc	ttatttacat	2880
ttttaaacag	gtactgaggg	actcctgtct	gccaggcgc	gtattgagta	ctttccacaa	2940
cctaatttaa	tccacactat	actgtgagat	taaaaacatt	cattaaaatg	ttgcaaaggt	3000
tctataaagc	tgagagacaa	atatattcta	taactcagca	atcccacttc	tagggtcgat	3060
cgacgttgc	attgatttatt	gactagttat	taatagtaat	caattacggg	gtcattagtt	3120
catagcccat	atatggagtt	ccgcgttaca	taacttacgg	taaatggccc	gcctggctga	3180
ccgccaacg	accccccgc	attgacgtca	ataatgacgt	atgtcccat	agtaacgcca	3240
ataggactt	tccattgacg	tcaatgggtg	gagtattac	ggtaaactgc	ccacttggca	3300
gtacatcaag	tgtatcatat	gccaagtacg	ccccctattt	acgtcaatga	cggtaaatgg	3360
ccgcctggc	attatgccc	gtacatgacc	ttatggact	ttcctacttg	gcagtgacatc	3420
tacgtattag	tcatcgctat	taccatggtg	atgcggttt	ggcagtgacat	caatggcgt	3480

ggatagcggt ttgactcacf gggattcca agtctccacc ccattgacgt caatggagt	3540
ttgtttggc accaaaatca acgggacttt ccaaaatgtc gtaacaactc cgccccattg	3600
acgcaaatgg gcggtaggcg tgtacggtgg gaggtctata taagcagagc tctctggcta	3660
actacagaac ccactgctta actggcttat cgaaattaat acgactcact atagggagac	3720
ccaagctcct cgaggctaga atgaagttgc ctgttaggct gttggtgctg atgttctgga	3780
ttcctggtga ggagagaggg aagtgaggga ggagaatgga cagggagcag gagcactgaa	3840
tcccattgct cattccatgt atctggcatg ggtgagaaga tgggtcttat cctccagcat	3900
ggggcctctg gggtaatac ttgttagagg gaggtccag atggAACat gtgtataat	3960
gaagattatg aaatggatgc ctggatggt ctaagtaatg ccttagaagt gactagacac	4020
ttgcaattca ctttttttgg taagaagaga ttttaggct ataaaaaaat gttatgtaaa	4080
aataaacat cacagttgaa ataaaaaaaaa aatataagga tttcatgaa ttttgttat	4140
aactatgtat ttctctctca ttgttcagc ttccttaagc gaggtgcagc tggcagtc	4200
cggcgccgag gtggagaagc cggcgccctc cgtgaagatc tcctgcaagg cctccgctc	4260
ctccttcacc ggctacaaca tgaactgggt gcgcagaac atcggcaagt ccctggagtg	4320
gatcggcgcc atcgaccctt actacggcgg cacctcctac aaccagaagt tcaaggccg	4380
cggccaccctg accgtggaca agtccaccc caccgcctac atgcacctga agtccctg	4440
ctccgaggac accgcccgtgt actactgcgt gtccggcatg gagtactggg gccaggcac	4500
ctccgtgacc gtgtcctccg gtaagcttt ctggggcagg ccaggcctga cttggctt	4560
ggggcagggga gggggctaag gtgaggcagg tggcgccagc caggtgcaca cccaatgccc	4620
atgagcccaag acactggacg ctgaacctcg cggacagtta agaaccagg ggcctctg	4680
ccctggggccc agctctgtcc cacaccgcgg tcacatggca ccacctctt tgcagcctcc	4740
accaaggggcc catcggtctt cccctggca ccctcctcca agagcaccc tggggcaca	4800
gcggccctgg gctgcctggt caaggactac ttccccaaac cggtgacggt gtcgtgaaac	4860
tcaggcgccc tgaccagcgg cgtgcacacc ttcccgctg tcctacagtc ctcaggactc	4920
tactccctca gcagcgtggt gaccgtgccc tccagcagct tggcaccacca gacctacatc	4980
tgcaacgtga atcacaagcc cagcaacacc aaggtggaca agagagttgg tgagaggcca	5040
gcacagggag ggagggtgtc tgctgaaagc caggctcagc gctcctgcct ggacgcattc	5100
cggctatgca gtcccagtcc agggcagcaa ggcaggcccc gtctgcctct tcacccggag	5160
gcctctgccc gccccactca tgctcaggaa gaggtcttc tggcttttc cccaggctct	5220
ggcaggcac aggctaggtg cccctaacc aggcctgca cacaagggg caggtgctgg	5280

gctcagacct gccaagagcc atatccggga ggaccctgcc cctgacctaa gcccacccca	5340
aaggccaaac tctccactcc ctcaagctcg acaccttctc tcctccaga ttccagtaac	5400
tcccaatctt ctctctgcag agcccaaatc ttgtgacaaa actcacacat gcccaccgtg	5460
cccaggttaag ccagcccagg cctcgccctc cagctcaagg cgggacaggt gcccctagagt	5520
agcctgcac tc cagggacagg ccccagccgg gtgctgacac gtccacctcc atctcttct	5580
cagcacctga actcctgggg ggaccgtcag tcttcctctt ccccccaaaa cccaaggaca	5640
ccctcatgtat ctcccgacc cctgaggtca catgcgttgtt ggtggacgtg agccacgaag	5700
accctgaggt caagttcaac tggtaacgtgg acggcgtgga ggtgcataat gccaagacaa	5760
agccgcggga ggagcagtac aacagcacgt accgtgttgtt cagcgtcctc accgtcctgc	5820
accaggactg gctgaatggc aaggagtaca agtgcaaggt ctccaacaaa gcccctccag	5880
cccccatcga gaaaaccatc tccaaagcca aaggtggac ccgtgggtg cgagggccac	5940
atggacagag gccggctcgg cccaccctct gcccctgagag tgaccgctgt accaacctct	6000
gtccctacag ggcagccccc agaaccacag gtgtacaccc tgccccatc acgggaggag	6060
atgaccaaga accaggtcag cctgacctgc ctggtaaag gcttctatcc cagcgacatc	6120
gccgtggagt gggagagcaa tggcagcccg gagaacaact acaagaccac gcctccgtg	6180
ctggactccg acggctcctt cttcccttat agcaagctca ccgtggacaa gagcaggtgg	6240
cagcagggga acgtcttctc atgctccgtg atgcatgagg ctctgcacaa ccactacacg	6300
cagaagagcc tctccctgtc cccggtaaa gccccactt caagttctac aaagaaaaca	6360
cagctgcaac tggagcatct cctgctggat ctccagatga ttctgaatgg aattaacaac	6420
tacaagaatc ccaaactcac caggatgctc acattcaagt tctacatgcc caagaaggcc	6480
acagagctca aacatctcca gtgtctagag gaggaactca aacctctgga ggaagtgcta	6540
aacctcgctc agagcaaaaa cttccactta agacctaggg acttaatcag caatatcaac	6600
gtaatagttc tggactaaa gggatccgaa acaacattca tgtgtgaata tgctgatgag	6660
acagcaacca ttgtagaatt tctgaacaga tggattacct tttgtcaaag catcatctca	6720
acactaactt gataattaag tgctcgaggg atccagacat gataagatac attgatgagt	6780
ttggacaaac cacaactaga atgcagtgaa aaaaatgctt tatttgtgaa atttgtgatg	6840
ctattgcttt atttgtaacc attagaagct gcaataaaca agttaacaac aacaattgca	6900
ttcatttat gtttcaggtt cagggggagg tgtggaggt ttttaaagc aagtaaaacc	6960
tctacaaatg tggatggct gattatgatc ctgcctcgcg cgttcggtg atgacggtga	7020
aaacctctga cacatgcagc tcccgagac ggtcacagct tgtctgtaag cgatgccgg	7080

gagcagacaa	gcccgtcagg	gcgcgtcagc	gggtgttggc	gggtgtcggg	gcgcagccat	7140
gacccagtca	cgtagcgata	gcggagtgta	tactggctta	actatgcggc	atcagagcag	7200
attgtactga	gagtgcacca	tatgcggtgt	gaaataccgc	acagatgcgt	aaggagaaaa	7260
taccgcacca	ggcgctcttc	cgcttcctcg	ctcactgact	cgctgcgctc	ggtcgttcgg	7320
ctgcggcgag	cggtatcagc	tcactcaaag	gcggtaataac	ggttatccac	agaatcaggg	7380
gataacgcag	gaaagaacat	gtgagcaaaa	ggccagcaaa	aggccaggaa	ccgtaaaaag	7440
gccgcgttgc	tggcgaaaa	ccataggctc	cgccccctg	acgagcatca	caaaaatcga	7500
cgctcaagtc	agaggtggcg	aaacccgaca	ggactataaa	gataccaggc	gtttccccct	7560
ggaagctccc	tcgtgcgctc	tcctgttccg	accctgcccgc	ttaccggata	cctgtccgccc	7620
tttctccctt	cgggaagcgt	ggcgctttct	caatgctcac	gctgttagta	tctcagttcg	7680
gtgttaggtcg	ttcgctccaa	gctgggctgt	gtgcacgaac	cccccggtca	gcccgaccgc	7740
tgcgccctat	ccggtaacta	tcgtctttag	tccaaccgg	taagacacga	cttacgcaca	7800
ctggcagcag	ccactggtaa	caggattagc	agagcgaggt	atgtaggcgg	tgctacagag	7860
ttcttgaagt	ggtggctaa	ctacggctac	actagaagga	cagtatttgg	tatctgcgt	7920
ctgctgaagc	cagttacctt	cggaaaaaga	gttggtagct	cttgatccgg	caaacaacc	7980
accgctggta	gcgggggttt	ttttgttgc	aagcagcaga	ttacgcgcag	aaaaaaagga	8040
tctcaagaag	atcctttgat	ctttctacg	gggtctgacg	ctcagtggaa	cgaaaactca	8100
cgttaaggga	ttttggtcat	gagattatca	aaaaggatct	tcacctagat	ccttttaaat	8160
taaaaatgaa	gttttaaatc	aatctaaagt	atatatgagt	aaacttggtc	tgacagttac	8220
caatgcttaa	tcagtgaggc	acctatctca	gcgatctgtc	tatttcgttc	atccatagtt	8280
gcctgactcc	ccgtcgtgta	gataactacg	atacgggagg	gcttaccatc	tggccccagt	8340
gctgcaatga	taccgcgaga	cccacgctca	ccggctccag	atttacgcag	aataaaccag	8400
ccagccggaa	gggcccggcg	cagaagtgg	cctgcaactt	tatccgcctc	catccagtct	8460
attaattgtt	gccgggaagc	tagagtaagt	agttcgccag	ttaatagttt	gcgcacgtt	8520
gttgcattt	ctgcaggcat	cgtgggtca	cgctcgtcgt	ttggtatggc	ttcattcagc	8580
tccggttccc	aacgatcaag	gcgagttaca	tgatccccca	tgttgtgcaa	aaaagcggtt	8640
agctccttcg	gtcctccgat	cgttgtcaga	agtaagttgg	ccgcagtggt	atcactcatg	8700
gttatggcag	cactgcataa	ttctcttact	gtcatgccat	ccgtaagatg	cttttctgtg	8760
actggtgagt	actcaaccaa	gtcattctga	gaatagtgt	tgccggcacc	gagttgctct	8820
tgcccgccgt	caacacggga	taataccgcg	ccacatagca	gaactttaaa	agtgcgtcatc	8880

attggaaaac gttcttcggg gcgaaaactc tcaaggatct taccgctgtt gagatccagt	8940
tcgatgtaac ccactcgtgc acccaactga tcttcagcat cttttacttt caccagcggt	9000
tctgggtgag caaaaacagg aaggcaaaat gccgcaaaaa aggaataag ggcgacacgg	9060
aaatgttcaa tactcatact cttcctttt caatattattt gaagcattta tcagggttat	9120
tgtctcatga gcggatacat atttgaatgt atttagaaaa ataaacaaat aggggttccg	9180
cgcacatttc cccgaaaagt gccacctgac gtctaagaaa ccattattat catgacatta	9240
acctataaaa ataggcgtat cacgaggccc tttcgtcttc aagaattccg atccagacat	9300
gataagatac attgatgagt ttggacaaac cacaactaga atgcagtcaa aaaaatgctt	9360
tatttgcgaa atttgcgatg ctattgcttt atttgcattt attagaagct gcaataaaca	9420
agttaacaac aacaattgca ttcattttt gtttcaggtt cagggggagg tgtggaggt	9480
tttttaaagc aagtaaaacc tctacaaatg tggatggct gattatgatc taaagccagc	9540
aaaagtccca tggcttataaaaatgcata gcttcggag gggaggcag aacttgaag	9600
catcttcctg ttagtcttc ttctcgtaga ccttaaattt atacttgcattt ctttttcct	9660
cctggacctc agagaggacg cctgggtatt ctgggagaag tttatatttc cccaaatcaa	9720
tttctggaa aaacgtgtca ctttcaaattt cctgcatttgc cttgtcaca aagagtctga	9780
ggtggcttgg ttgattcatg gtttcgttgg aaacagaact gcctccgact atccaaacca	9840
tgtctacttt acttgccaaat tccgggtgtt caataagtct taaggcatca tccaaacttt	9900
tggcaagaaa atgagctcct cgtgggtgtt ctttgagttc tctactgaga actatattaa	9960
ttctgtcctt taaaggcgtca ttcttcgtca gaatggagaa ccagggtttc ctacccataa	10020
tcaccagatt ctgtttaccc tccactgaag aggttgcgtt cattcttgg aagtacttgc	10080
actcgttccct gagcggaggc cagggtcggt ctccgttctt gccaatcccc atatttggg	10140
acacggcgcac gatgcagttc aatggtcgaa ccatgaggc accaagctag cttttgcaa	10200
aagcctaggc ctccaaaaaa gcctcctcac tacttctgga atagctcaga ggccgaggcg	10260
gcctcggcct ctgcataaaat aaaaaaaatt agtcagccat gggcggaga atggcggaa	10320
ctggcggag tttagggcgg gatggcggaa gtttagggcgg ggactatggt tgctgactaa	10380
ttgagatgca tgcttgcattt acttctgcct gctggggagc ctggggactt tccacacctg	10440
gttgctgact aattgagatg catgcttgc atacttctgc ctgctggggaa gcctggggac	10500
tttccacacc ctaactgaca cacattccac a	10531

<210> 5
 <211> 220
 <212> PRT

<213> Artificial Sequence

<220>

<223> Humanized Immunoglobulin light chain

<400> 5

Asp Val Val Met Thr Gln Thr Pro Leu Ser Leu Pro Val Thr Pro Gly
1 5 10 15

Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser Leu Val His Arg
20 25 30

Asn Gly Asn Thr Tyr Leu His Trp Tyr Leu Gln Lys Pro Gly Gln Ser
35 40 45

Pro Lys Leu Leu Ile His Lys Val Ser Asn Arg Phe Ser Gly Val Pro
50 55 60

Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Lys Ile
65 70 75 80

Ser Arg Val Glu Ala Glu Asp Leu Gly Val Tyr Phe Cys Ser Gln Ser
85 90 95

Thr His Val Pro Pro Leu Thr Phe Gly Ala Gly Thr Lys Leu Glu Leu
100 105 110

Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp
115 120 125

Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn
130 135 140

Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp Asn Ala Leu
145 150 155 160

Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp Ser Lys Asp
165 170 175

Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr
180 185 190

Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln Gly Leu Ser
195 200 205

Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys

210

215

220

<210> 6
<211> 575
<212> PRT
<213> Artificial Sequence

<220>
<223> Humanized Immunoglobulin heavy chain and IL-2

<400> 6

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Glu Lys Pro Gly Ala
1 5 10 15

Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Ser Ser Phe Thr Gly Tyr
20 25 30

Asn Met Asn Trp Val Arg Gln Asn Ile Gly Lys Ser Leu Glu Trp Ile
35 40 45

Gly Ala Ile Asp Pro Tyr Tyr Gly Gly Thr Ser Tyr Asn Gln Lys Phe
50 55 60

Lys Gly Arg Ala Thr Leu Thr Val Asp Lys Ser Thr Ser Thr Ala Tyr
65 70 75 80

Met His Leu Lys Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Val Ser Gly Met Glu Tyr Trp Gly Gln Gly Thr Ser Val Thr Val Ser
100 105 110

Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser
115 120 125

Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp
130 135 140

Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr
145 150 155 160

Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr
165 170 175

Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln
180 185 190

Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp
195 200 205

Lys Arg Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro
210 215 220

Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro
225 230 235 240

Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr
245 250 255

Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn
260 265 270

Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg
275 280 285

Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val
290 295 300

Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser
305 310 315 320

Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys
325 330 335

Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu
340 345 350

Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe
355 360 365

Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu
370 375 380

Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe
385 390 395 400

Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly
405 410 415

Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr
420 425 430

Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Ala Pro Thr Ser Ser Ser
435 440 445

Thr Lys Lys Thr Gln Leu Gln Leu Glu His Leu Leu Leu Asp Leu Gln
450 455 460

Met Ile Leu Asn Gly Ile Asn Asn Tyr Lys Asn Pro Lys Leu Thr Arg
465 470 475 480

Met Leu Thr Phe Lys Phe Tyr Met Pro Lys Lys Ala Thr Glu Leu Lys
485 490 495

His Leu Gln Cys Leu Glu Glu Leu Lys Pro Leu Glu Glu Val Leu
500 505 510

Asn Leu Ala Gln Ser Lys Asn Phe His Leu Arg Pro Arg Asp Leu Ile
515 520 525

Ser Asn Ile Asn Val Ile Val Leu Glu Leu Lys Gly Ser Glu Thr Thr
530 535 540

Phe Met Cys Glu Tyr Ala Asp Glu Thr Ala Thr Ile Val Glu Phe Leu
545 550 555 560

Asn Arg Trp Ile Thr Phe Cys Gln Ser Ile Ile Ser Thr Leu Thr
565 570 575